

## SECTION 07530 – FLEXIBLE SHEET ROOFING SYSTEM FOR METAL ROOF RETROFIT

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Adhered membrane attached metal retrofit roofing system, including membrane, flashings, and other components.
  - 2. Flashings and other accessories as indicated on drawings to include substrate preparation, roof drains, vapor barrier, fire retardant treated wood blocking, insulation, separation layers, roof membrane, fasteners, adhesive for flashings, roof membrane flashings, walkways, metal flashings, and sealants.

#### 1.2 PERFORMANCE REQUIREMENTS

- A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by flexible sheet roof (FSR) membrane manufacturer based on testing and field experience.
- C. Roofing System Design: Provide a membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE 7-98.
  - 1. Design wind velocity shall be 152 mph with a wind load importance factor of 1.10.
  - 2. Design pressures are indicated on structural drawings and are to be calculated based on wind velocity.
- D. FMG Listing: Provide roofing membrane, base flashings, and component materials that comply with requirements in FMG 4450 and FMG 4470 as part of a membrane roofing system and that are listed in FMG's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.

#### 1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other Work.
  - 1. Base flashings and membrane terminations.
- C. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.

- D. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
  - 1. Submit evidence of meeting performance requirements.
- E. Maintenance Data: For roofing system to include in maintenance manuals.
- F. Warranties: Special warranties specified in this Section.
- G. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's warranty.
- B. Manufacturer Qualifications: A qualified manufacturer that has FMG approval for membrane roofing system identical to that used for this Project.
- C. Source Limitations: Obtain components for membrane roofing system from roofing membrane manufacturer.
- D. Fire-Test-Response Characteristics: Provide membrane roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
  - 1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
  - 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

#### 1.6 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

## 1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form, without monetary limitation, in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.
1. Special warranty includes roofing membrane, base flashings, roofing membrane accessories, roof insulation, fasteners, and other components of membrane roofing system.
  2. Warranty Period: **15 years** from date of Substantial Completion.
  3. Warranty shall be provided in writing prior to final payment.
  4. No freshwater or saltwater exclusions are acceptable.

## PART 2 - PRODUCTS

### 2.1 GENERAL:

- A. Performance: Provide roofing materials recognized to be of generic type indicated and tested to show compliance with indicated performances, or provide other similar materials certified in writing by manufacturer to be equal or better than specified in every significant respect, and acceptable to Architect.
- B. Compatibility: Provide products which are recommended by manufacturers to be fully compatible with indicated substrates, or provide separation materials as required to eliminate contact between incompatible materials.
- C. Products: Thermoplastic Membrane Roofing: **Nominal 60 mil thickness (but not less than 54 mils actual); exposed face to be white in color with a solar reflectance index (SRI) of 78 or greater.**

### 2.2. ACCEPTABLE PRODUCTS:

- A. PVC Sheet: ASTM D 4434, Type II, Grade 1, fiber reinforced and fabric backed.
1. "Sarnafil S327-15, 60 mil by Sarnafil Inc.
  2. Duro-Last: Duro- Last membrane and flashing sheet.
  3. EverGuard SR-60 by GAF - EverGuard membrane and flashing sheet.
- B. PVC Sheet: ASTM D 4434, Type III, fabric reinforced and fabric backed, as follows:
1. Product: Provide "UltraGuard PVC" by Johns Manville International, Inc.
- C. PVC Sheet: ASTM D 4434, Type IV, fabric reinforced and fabric backed, as follows:
1. Product: Provide "FiberTite" by Seaman Corporation.

### 2.3 AUXILIARY MATERIALS:

1. Sheet Seaming System: Manufacturer's standard materials for sealing lapped joints, including edge sealer to cover exposed spliced edges as recommended by manufacturer of FSR system.

2. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
3. Liquid-type auxiliary materials shall meet VOC limits of authorities having jurisdiction.
4. Sheet Flashing: Manufacturer's standard sheet flashing of same material, type, reinforcement, thickness, and color as PVC sheet membrane
5. Bonding Adhesive: Manufacturer's standard water-based bonding adhesive for membrane, and solvent-based bonding adhesive for base flashings.
6. Metal termination bars, if required: Manufacturer's standard predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.
7. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, termination reglets, cover strips, and other accessories.
8. Cant strips, Tapered Edge Strips and Flashing Accessories: Types recommended by manufacturer of FSR material, provided at locations indicated and at locations recommended by manufacturer, including adhesive tapes, flashing cements, and sealants.
9. Slip Sheet: Type recommended by manufacturer of FSR material for protection of membrane from incompatible substrates.
10. Provide underlayment, if required, by FSR membrane manufacturer. Prime underlayment with primer compatible with membrane.
11. Underlayment: Provide 1/2" DensDeck Prime underlayment boards under fully-adhered roofing membrane, below rigid insulation. Provide DensDeck Prime boards with green, non-asphaltic coating - allowing for better bonding to roof membrane - by Georgia Pacific or approved equal. Install with fasteners per manufacturers requirements to meet specified uplift and wind loading.
12. Flute Filler: Provide beveled flute-fill insulation designed to fit between the valleys of the existing metal roof. Provide R value with project submittal for this material per manufacturer's data.

#### 2.4 INSULATING MATERIALS:

1. General: Provide insulating materials to comply with requirements indicated for materials and compliance with referenced standards; in sizes to fit applications indicated, selected from manufacturer's standard thicknesses, widths and lengths.
1. Polyisocyanurate Board Roof Insulation: Rigid, cellular thermal insulation with polyisocyanurate closed-cell foam core and manufacturer's standard facing laminated to both sides; complying with FS HH-I-1972/2, Class 1; aged R-values as designated at mean temperatures indicated, after conditioning per RIC/TIMA Bulletin #281-1; and as follows:

Surface Burning Characteristics: Maximum flame spread of 25

Thermal Resistivity: 14.4 at 75 deg F (23.9 deg C) for 2 1/2" thick insulation board.

"R" Value: As shown on Roof Plan (not less than R=20).

Provide taper units as shown to achieve positive roof drainage.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
  - 1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
  - 2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
  - 3. Verify that surface plane flatness and fastening of existing metal roof comply with requirements of retrofit manufacturer.
  - 4. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

### 3.3 ROOFING INSTALLATION

- A. Install roofing membrane over area to receive roofing according to membrane roofing system manufacturer's written instructions. Unroll roofing membrane and allow to relax before installing.
  - 1. Install sheet according to ASTM D 5036.
- B. Start installation of roofing membrane in presence of membrane roofing system manufacturer's technical personnel.
- C. Accurately align roofing membrane and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- D. Bonding Adhesive: Apply water-based bonding adhesive to substrate at rate required by manufacturer and immediately install roofing membrane. Do not apply bonding adhesive to splice area of roofing membrane.
- E. Mechanically or adhesively fasten roofing membrane securely at terminations, penetrations, and perimeter of roofing.
- F. Apply roofing membrane with side laps shingled with slope of roof deck where possible.
- G. Seams: Clean seam areas, overlap roofing membrane, and hot-air weld side and end laps of roofing membrane according to manufacturer's written instructions to ensure a watertight seam installation.

1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roofing membrane.
2. Verify field strength of seams a minimum of twice daily and repair seam sample areas.
3. Repair tears, voids, and lapped seams in roofing membrane that does not meet requirements.

H. Spread sealant or mastic bed over deck drain flange at deck drains and securely seal roofing membrane in place with clamping ring.

### 3.4 BASE FLASHING INSTALLATION

A. Install sheet flashings and performed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.

B. Apply solvent-based bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.

C. Clean seam areas and overlap and firmly roll sheet flashings into the adhesive. Weld side and end laps to ensure a watertight seam installation.

D. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

### 3.5 FIELD QUALITY CONTROL

A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Architect.

1. Notify Architect or Owner 48 hours in advance of date and time of inspection.

2. Contractor shall provide Architect a Final Statement of Compliance which states that the finished roof membrane complies with the Contract Documents.

B. Repair or remove and replace components of membrane roofing system where test results or inspections indicate that they do not comply with specified requirements.

C. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

1. The manufacturer's representative shall inspect the roof membrane within one year of acceptance of the roof membrane by the Board.

### 3.6 PROTECTING AND CLEANING

A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements, repair substrates, and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

3.7 MECHANICALLY ATTACHED MEMBRANE ROOFING:

- A. Install membrane by unrolling over prepared substrate, lapping adjoining sheets as recommended by manufacturer, and bonding and sealing seams. Underlayment boards are not required unless specifically required by roofing manufacturer. Install membrane with mechanical fasteners at spacing recommended by manufacturer, covering with adhesive-applied membrane so that no fasteners are exposed. Install flashings and counter-flashings as recommended by manufacturer. Install fasteners at perimeter and field locations with spacings to meet specified uplift and wind loading requirements.

END OF SECTION

## **SECTION 10500 - METAL LOCKERS**

### **1.0 PART 1: GENERAL**

- 1.1 Submittals:** In addition to product data and installation instructions, provide samples manufacturers standard colors for selection.

Submit shop drawings for metal lockers, verifying dimensions affecting locker installation; include installation details, bases, trim, accessories, and numbering sequence information.

### **2.0 PART 2 - PRODUCTS**

- 2.1 Manufacturer:** Subject to compliance with requirements, provide products by one of the following:

Double Tier Lockers:

De Bourgh Manufacturing Co.  
Interior Steel Equipment Co.  
List Industries Inc.  
Lyon Metal Products  
Medart Inc.  
Penco Products Inc.  
Republic Storage Systems

### **2.2 Fabrication, General:**

- A. Construction:** Square, rigid, without warp, exposed edges safe to touch. Frames welded together; other joints welded, riveted, or bolted as standard with manufacturer with no bolts or rivets exposed on front of doors and frames. Welds ground flush.
- B. Frames:** Steel 16-gage channels or 12-gage angles, with continuous stops/strike formed on vertical members.
- C. Hinges:** Steel, full loop, 5 knuckle, tight pin, welded to frame, screwed to door. Provide 2 hinges per door 42 inches and under and 3 hinges for doors over 42 inches high.
- D. Finish:** Manufacturer's standard baked enamel in colors indicated, or as selected from manufacturer's standard colors.
- E. Doors:** Provide 180 degree opening, one-piece doors formed of 16- gage sheet steel, flanged at all edges, constructed to prevent springing when opening or closing.
- F. Ventilation:** Provide stamped, louvered vents in door face, as follows:  
  
**Double-tier Lockers:** Min. 3 louver openings, top and bottom.
- G. Recessed Handle and Latch:** Pry-resistant latch, housing forming recess for latch lifter and locking devices, and non-protruding latch lifter with eye and strike for padlock.
- H. Double-tier Lockers:** Min. 2-point latching.

2.3 Locker Accessories:

- a. Padlock: Furnished by Owner.
- b. Equipment: One double-prong ceiling hook and not fewer than 2 single prong wall hooks per locker.
- c. Number Plates: Manufacturer's standard, nonferrous metal, attached to door with matching fasteners; number sequence as indicated.
- d. Metal Base: Manufacturer's standard, continuous, finished to match lockers.
- e. Sloping Tops: 20-gage steel, approximately 25 degrees pitch, continuous, with closures at exposed ends, finished to match lockers.
- f. Filler Panels: 16-gage steel sheet, factory fabricated and finished to match locker units.

3.0 PART 3: EXECUTION

- 3.1 Installation: Plumb, level, rigid in compliance with manufacturer's instructions. Provide trim and filler panels as required using concealed fasteners. Fasten lockers and benches if any, to floor, unless otherwise indicated.

END OF SECTION 10500

## SECTION 16720 - FIRE DETECTION AND ALARM SYSTEM

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

- A. This section of the specification includes the furnishing, installation, connection and testing of the microprocessor controlled, intelligent reporting fire alarm equipment required to form a complete, operative, coordinated system. It shall include, but not be limited to, alarm initiating devices, alarm notification appliances, Fire Alarm Control Panel (FACP), auxiliary control devices, annunciators, and wiring as shown on the drawings and specified herein.
- B. The fire alarm system shall comply with requirements of NFPA Standard 72 for Protected Premises Signaling Systems except as modified and supplemented by this specification. The system shall be electrically supervised and monitor the integrity of all conductors.
- C. The FACP and peripheral devices shall be manufactured 100% by a single U.S. manufacturer (or division thereof).
- D. The system and its components shall be Underwriters Laboratories, Inc. listed under the appropriate UL testing standard as listed herein for fire alarm applications and the installation shall be in compliance with the UL listing.

#### 1.02 SCOPE

- A. A new intelligent reporting, microprocessor controlled fire detection system shall be installed in accordance to the project specifications and drawings.
- B. Basic Performance:
  - 1. Alarm, trouble and supervisory signals from all intelligent reporting devices shall be encoded on NFPA Style 4 (Class B) Signaling Line Circuits (SLC).
  - 2. Initiation Device Circuits (IDC) shall be wired Class A (NFPA Style D) as part of an addressable device connected by the SLC Circuit.
  - 3. Notification Appliance Circuits (NAC) shall be wired Class A (NFPA Style Z) as part of an addressable device connected by the SLC Circuit.
  - 4. On Style 6 or 7 (Class A) configurations a single ground fault or open circuit on the system Signaling Line Circuit shall not cause system malfunction, loss of operating power or the ability to report an alarm.
  - 5. Alarm signals arriving at the FACP shall not be lost following a primary power failure (or outage) until the alarm signal is processed and recorded.
  - 6. All circuits shall be power-limited, per UL864 requirements.
  - 7. NAC speaker circuits shall be arranged such that there is a minimum of one speaker circuit per floor of the building or smoke zone which ever is greater.
  - 8. Audio amplifiers and tone generating equipment shall be electrically supervised for normal and abnormal conditions.
  - 9. NAC speaker circuits and control equipment shall be arranged such that loss of any one (1) speaker circuit will not cause the loss of any other speaker circuit in the system.
  - 10. Two-way telephone communication circuits shall be supervised for open and short circuit conditions.
  - 11. The FACP shall be equipped with a DACT capable of communicating to offsite monitoring, consisting of panel condition and zone information in SIA and Contact ID formats. The format shall be determined at the time of installation by the building authorized representative.

- C. Basic System Functional Operation - When a fire alarm condition is detected and reported by one of the system initiating devices, the following functions shall immediately occur:
1. The system alarm LED on the system display shall flash.
  2. A local piezo electric signal in the control panel shall sound.
  3. A backlit LCD display shall indicate all information associated with the fire alarm condition, including the type of alarm point and its location within the protected premises.
  4. Printing and history storage equipment shall log the information associated with each new fire alarm control panel condition, along with time and date of occurrence.
  5. All system output programs assigned via control-by-event interlock programming to be activated by the particular point in alarm shall be executed, and the associated system outputs (notification appliances and/or relays) shall be activated.

### 1.03 SUBMITTALS

A. General:

1. Copies of all submittals shall be submitted to the Architect/Engineer for review. Coordinate quantity with Architect.

B. Shop Drawings:

1. Shall be prepared by persons with the following qualifications:
  - a. Trained and certified by manufacturer in fire alarm system design.
  - b. Fire alarm certified by NICET, minimum Level III.
2. Sufficient information, clearly presented, shall be included to determine compliance with drawings and specifications.
3. Include manufacturer's name(s), model numbers, ratings, power requirements, equipment layout, device arrangement, complete wiring point-to-point diagrams, conduit layouts, and riser diagram.
4. Show annunciator layout, configurations, and terminations.
5. Battery size calculation, NAC circuit cable voltage drop calculation.

C. Manuals:

1. Submit simultaneously with the shop drawings, complete operating and maintenance manuals listing the manufacturer's name(s), including technical data sheets.
2. Wiring diagrams shall indicate internal wiring for each device and the interconnections between the items of equipment.
3. Provide a clear and concise description of operation that gives, in detail, the information required to properly operate the equipment and system.

D. Software Modifications

1. Provide the services of a factory trained and authorized technician to perform all system software modifications, upgrades or changes. Response time of the technician to the site shall not exceed 4 hours.
2. Provide all hardware, software, programming tools and documentation necessary to modify the fire alarm system on site. Modification includes addition and deletion of devices, circuits, zones and changes to system operation and custom label changes for devices or zones. The system structure and software shall place no limit on the type or extent of software modifications on-site. Modification of software shall not require power-down of the system or loss of system fire protection while modifications are being made.

- E. Certifications: Together with the shop drawing submittal, submit a certification from the major equipment manufacturer indicating that the proposed supervisor of the installation and the proposed performer of contract maintenance is an authorized representative of the major equipment manufacturer. Include names and addresses in the certification.

1.04 GUARANTY

- A. All work performed and all material and equipment furnished under this contract shall be free from defects and shall remain so for a period of at least one (1) year from the date of acceptance. The full cost of maintenance, labor and materials required to correct any defect during this one year period shall be included in the submittal bid.

1.05 POST CONTRACT MAINTENANCE

- A. Complete maintenance and repair service for the fire alarm system shall be available from a factory trained authorized representative of the manufacturer of the major equipment for a period of five (5) years after expiration of the guaranty.
- B. As part of the bid/proposal, include a quote for a maintenance contract to provide all maintenance, tests, and repairs described below. Include also a quote for unscheduled maintenance/repairs, including hourly rates for technicians trained on this equipment, and response travel costs for each year of the maintenance period. Rates and costs shall be valid for the period of five (5) years after expiration of the guaranty.
- C. Maintenance and testing shall be on a semiannual basis or as required by the AHJ. A preventive maintenance schedule shall be provided by the contractor describing the protocol for preventive maintenance. The schedule shall include:
  - 1. Systematic examination, adjustment and cleaning of all detectors, manual fire alarm stations, control panels, power supplies, relays, waterflow switches and all accessories of the fire alarm system.
  - 2. Each circuit in the fire alarm system shall be tested semiannually.

1.06 APPLICABLE STANDARDS AND SPECIFICATIONS

The specifications and standards listed below form a part of this specification. The system shall fully comply with the latest issue of these standards, if applicable.

- A. National Fire Protection Association (NFPA) - USA:

No. 13	Sprinkler Systems
No. 15	Water Spray Systems
No. 16	Foam/Water Deluge and Spray Systems
No. 70	National Electric Code
No. 72	National Fire Alarm Code
No. 101	Life Safety Code

- B. Underwriters Laboratories Inc. (UL) - USA:

No. 268	Smoke Detectors for Fire Protective Signaling Systems
No. 864	Control Units for Fire Protective Signaling Systems
No. 268A	Smoke Detectors for Duct Applications
No. 521	Heat Detectors for Fire Protective Signaling Systems
No. 464	Audible Signaling Appliances
No. 38	Manually Actuated Signaling Boxes
No. 50	Cabinets and Boxes

No. 346	Waterflow Indicators for Fire Protective Signaling Systems
No. 1076	Control Units for Burglar Alarm Proprietary Protective Signaling Systems
No. 1971	Visual Notification Appliances

- C. Local and State Building Codes.
- D. All requirements of the Authority Having Jurisdiction (AHJ)

#### 1.07 APPROVALS

- A. The system shall have proper listing and/or approval from the following nationally recognized agencies:
  - 1. UL Underwriters Laboratories Inc
- B. The fire alarm control panel shall meet UL Standard 864 Ninth Edition (Control Units).

### PART 2 - PRODUCTS

#### 2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. FACP and Equipment:
    - a. Edwards Systems Technology
    - b. Notifier; by Honeywell
    - c. Siemens Building Technologies
    - d. Gamewell Fire Control Instruments
    - e. Fike Corporation
    - f. SimplexGrinnell
  - 2. Wire and Cable:
    - a. Comtran Corporation
    - b. Helix/HiTemp Cables, inc.; by Draka USA
    - c. Rockbestos-Suprenant Cable Corporation; by Marmon Group Company
    - d. West Penn Wire/CDT; by Cable Design Technologies

#### 2.02 EQUIPMENT AND MATERIAL, GENERAL

- A. All equipment and components not shown as existing to remain on the contract documents, shall be new, and the manufacturer's current model. The materials, appliances, equipment and devices shall be tested and listed by a nationally recognized approvals agency for use as part of a protective signaling system, meeting the National Fire Alarm Code.
- B. All equipment and components shall be installed in strict compliance with manufacturers' recommendations. Consult the manufacturer's installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc., before beginning system installation.
- C. All equipment shall be attached to walls and ceiling/floor assemblies and shall be held firmly in place (e.g., detectors shall not be supported solely by suspended ceilings). Fasteners and supports shall be adequate to support the required load.

#### 2.03 CONDUIT AND WIRE

- A. Conduit:

1. Conduit shall be in accordance with The National Electrical Code (NEC), local and state requirements.
2. All wiring shall be installed in conduit or raceway. Conduit fill shall not exceed 40 percent of interior cross sectional area where three or more cables are contained within a single conduit.
3. Cable must be separated from any open conductors of power, or Class 1 circuits, and shall not be placed in any conduit, junction box or raceway containing these conductors, per NEC Article 760-55.
4. Wiring for 24 volt DC control, alarm notification, emergency communication and similar power-limited auxiliary functions may be run in the same conduit as initiating and signaling line circuits. All circuits shall be provided with transient suppression devices and the system shall be designed to permit simultaneous operation of all circuits without interference or loss of signals.
5. Conduit shall not enter the fire alarm control panel, or any other remotely mounted control panel equipment or backboxes, except where conduit entry is specified by the FACP manufacturer.
6. Conduit shall be 3/4-inch (19.1 mm) minimum.

B. Wire:

1. All fire alarm system wiring shall be new.
2. Wiring shall be in accordance with local, state and national codes (e.g., NEC Article 760) and as recommended by the manufacturer of the fire alarm system. Number and size of conductors shall be as recommended by the fire alarm system manufacturer, but not less than 18 AWG (1.02 mm) for Initiating Device Circuits and Signaling Line Circuits, and 14 AWG (1.63 mm) for Notification Appliance Circuits.
3. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system.
4. Wiring used for the multiplex communication circuit (SLC) shall be twisted and unshielded and support a minimum wiring distance of 12,500 feet. The design of the system shall permit use of IDC and NAC wiring in the same conduit with the SLC communication circuit.
5. All field wiring shall be electrically supervised for open circuit and ground fault.
6. The fire alarm control panel shall be capable of t-tapping Class B (NFPA Style 4) Signaling Line Circuits (SLCs). Systems that do not allow or have restrictions in, for example, the amount of t-taps, length of t-taps etc., are not acceptable.

C. Terminal Boxes, Junction Boxes and Cabinets: All boxes and cabinets shall be UL listed for their use and purpose.

D. Initiating circuits shall be arranged to serve like categories (manual, smoke, waterflow). Mixed category circuitry shall not be permitted except on signaling line circuits connected to intelligent reporting devices.

E. The fire alarm control panel shall be connected to a separate dedicated branch circuit, maximum 20 amperes. This circuit shall be labeled at the main power distribution panel as FIRE ALARM. Fire alarm control panel primary power wiring shall be 12 AWG. The control panel cabinet shall be grounded securely to either a cold water pipe or grounding rod.

2.04 MAIN FIRE ALARM CONTROL PANEL OR NETWORK NODE

A. Main FACP or network node shall contain a microprocessor based Central Processing Unit (CPU) and power supply. The CPU shall communicate with and control the following types of equipment used to make up the system: intelligent addressable smoke and thermal (heat) detectors, addressable

modules, printer, annunciators, and other system controlled devices.

B. Operator Control

1. Acknowledge Switch:

- a. Activation of the control panel acknowledge switch in response to new alarms and/or troubles shall silence the local panel piezo electric signal and change the alarm and trouble LEDs from flashing mode to steady-ON mode. If multiple alarm or trouble conditions exist, depression of this switch shall advance the LCD display to the next alarm or trouble condition.
- b. Depression of the Acknowledge switch shall also silence all remote annunciator piezo sounders.

2. Alarm Silence Switch: Activation of the alarm silence switch shall cause all programmed alarm notification appliances and relays to return to the normal condition after an alarm condition. The selection of notification circuits and relays that are silenceable by this switch shall be fully field programmable within the confines of all applicable standards. The FACP software shall include silence inhibit and auto-silence timers.

3. Alarm Activate (Drill) Switch: The Alarm Activate switch shall activate all notification appliance circuits. The drill function shall latch until the panel is silenced or reset.

4. System Reset Switch: Activation of the System Reset switch shall cause all electronically-latched initiating devices, appliances or software zones, as well as all associated output devices and circuits, to return to their normal condition.

5. Lamp Test: The Lamp Test switch shall activate all local system LEDs, light each segment of the liquid crystal display and display the panel software revision for service personal.

C. System Capacity and General Operation

1. The control panel or each network node shall include Form-C alarm, trouble, and supervisory relays rated at a minimum of 2.0 amps @ 30 VDC.

2. It shall include Class B (NFPA Style Y) or Class A (NFPA Style Z) programmable Notification Appliance Circuits.

3. The Notification Appliance Circuits shall be programmable to Synchronize with System Sensor, and Notification Appliances.

4. The system shall include a full featured operator interface control and annunciation panel that shall include a backlit Liquid Crystal Display (LCD), individual color coded system status LEDs, and an alphanumeric keypad with easy touch keys for the field programming and control of the fire alarm system.

5. The system shall be programmable, configurable, and expandable in the field without the need for special tools, PROM programmers or PC based programmers.

6. The system shall allow the programming of any input to activate any output or group of outputs

7. The FACP or each network node shall provide the following features:

- a. Drift compensation to extend detector accuracy over life. Drift compensation shall also include a smoothing feature, allowing transient noise signals to be filtered out.
- b. Detector sensitivity test, meeting requirements of NFPA 72, Chapter 7.
- c. Maintenance alert, with two levels (maintenance alert/maintenance urgent), to warn of excessive smoke detector dirt or dust accumulation.
- d. Multiple sensitivity levels for alarm, selected by detector. The system shall also support sensitive advanced detection laser detectors. The system shall also include multiple levels of Prealarm, selected by detector, to indicate impending alarms to maintenance personnel.
- e. The ability to display or print system reports.
- f. Alarm verification, with counters and a trouble indication to alert maintenance personnel.

- g. PAS presignal, meeting NFPA 72 3-8.3 requirements.
  - h. Devices shall meet NFPA 72 Chapter 1 requirements for activation of notification circuits within 10 seconds of initiating device activation.
  - i. Periodic detector test, conducted automatically by the software.
  - j. Self optimizing pre-alarm for advanced fire warning, which allows each detector to learn its particular environment and set its prealarm level to just above normal peaks.
  - k. Cross zoning with the capability of counting: two detectors in alarm, two software zones in alarm, or one smoke detector and one thermal detector.
  - l. Walk test, with a check for two detectors set to same address.
  - m. Day/night automatic adjustment of detector sensitivity.
8. The FACP shall be capable of coding main panel node notification circuits in March Time (120 PPM), and Temporal (NFPA 72 A-2-2.2.2). Panel notification circuits (NAC 1,2,3 and 4) shall also support Two-Stage operation. Two stage operation shall allow 20 Pulses Per Minute (PPM) on alarm and 120 PPM after 5 minutes or when a second device activates.
9. Network Communication
- a. The FACP shall be capable of communicating on a Local Area Network (LAN), a firmware package that utilizes a peer-to-peer, inherently regenerative communication format and protocol.

D. Central Microprocessor

- 1. The microprocessor shall be a state-of-the-art, high speed device and it shall communicate with, monitor and control all external interfaces. It shall include an EPROM for system program storage, Flash memory for building-specific program storage, and a "watch dog" timer circuit to detect and report microprocessor failure.
- 2. The microprocessor shall contain and execute all control-by-event programs for specific action to be taken if an alarm condition is detected by the system. Control-by-event equations shall be held in non-volatile programmable memory, and shall not be lost even if system primary and secondary power failure occurs.
- 3. The microprocessor shall also provide a real-time clock for time annotation of system displays, printer, and history file. The time-of-day and date shall not be lost if system primary and secondary power supplies fail. The real time clock may also be used to control non-fire functions at programmed time-of-day, day-of-week, and day-of-year.
- 4. A special program check function shall be provided to detect common operator errors.
- 5. An auto-program (self-learn) function shall be provided to quickly install initial functions and make the system operational.
- 6. For flexibility and to ensure program validity, an optional Windows(TM) based program utility shall be available. This program shall be used to off-line program the system with batch upload/download, and have the ability to upgrade the manufacturers (FLASH) system code changes. This program shall also have a verification utility, which scans the program files, identifying possible errors. It shall also have the ability to compare old program files to new ones, identifying differences in the two files to allow complete testing of any system operating changes. This shall be in compliance with the NFPA 72 requirements for testing after system modification.

E. System Display

- 1. The system shall support the following display mode options:
  - a. 80 character display option. The display shall include an 80-character backlit alphanumeric Liquid Crystal Display (LCD) and a full PC style QWERTY keypad.
- 2. The display shall provide all the controls and indicators used by the system operator:
  - a. The 80-character display shall include the following operator control switches: ACKNOWLEDGE, ALARM SILENCE, ALARM ACTIVATE (drill), SYSTEM RESET, and LAMP TEST.

3. The display shall annunciate status information and custom alphanumeric labels for all intelligent detectors, addressable modules, internal panel circuits, and software zones.
4. The display shall also provide Light-Emitting Diodes.
  - a. The 80-character display shall provide 12 Light-Emitting-Diodes (LEDs), that indicate the status of the following system parameters: AC POWER, FIRE ALARM, PREALARM WARNING, SUPERVISORY SIGNAL, SYSTEM TROUBLE, DISABLED POINTS, ALARM SILENCED, Controls Active, Pre-Discharge, Discharge and Abort.
5. The display shall have QWERTY type keypad.
  - a. The 80-character display keypad shall be an easy to use QWERTY type keypad, similar to a PC keyboard. This shall be part of the standard system and have the capability to command all system functions, entry of any alphabetic or numeric information, and field programming. Two different password levels shall be provided to prevent unauthorized system control or programming.
6. The system shall support the display of battery charging current and voltage on the 80-character LCD display.

F. Signaling Line Circuits (SLC)

1. Each SLC interface shall provide power to and communicate with intelligent detectors (ionization, photoelectric or thermal) and intelligent modules (monitor or control).
2. CPU shall receive information from all intelligent detectors to be processed to determine whether normal, alarm, prealarm, or trouble conditions exist for each detector. The software shall automatically maintain the detector's desired sensitivity level by adjusting for the effects of environmental factors, including the accumulation of dust in each detector. Information shall also be used for automatic detector testing and for the automatic determination of detector maintenance requirements.

G. Serial Interfaces: The system shall include a minimum of two interfaces as a means of connecting UL Listed Information Technology Equipment (ITE) peripherals.

H. Voice Command Center (VCC)

1. The facility shall have an emergency voice alarm communication system. Digitally stored message sequences shall notify the building occupants that a fire or life safety condition has been reported. A Message generator shall be capable of automatically distributing up to four (4) simultaneous, unique messages to appropriate audio zones within the facility based on the type and location of the initiating event. The Fire Command Center (FCC) shall also support Emergency manual voice announcement capability for both system wide or selected audio zones, and shall include provisions for the system operator to override automatic messages system wide or in selected zones.
  - a. The digital audio message generator shall be of reliable, non-moving parts, and support the digital storage of at least 16 or 32 minutes of tones and emergency messages, shall support programming options to string audio segments together to create up to 1000 messages, or to loop messages and parts of messages to repeat for pre-determined cycles or indefinitely.
  - b. The audio portion of the system shall sound the proper audio signal (consisting of tone, voice, or tone and voice) to the appropriate zones.
  - c. Notification Appliance Circuits (NAC) speaker circuits shall be arranged such that there is a minimum of one speaker circuit per floor of the building or smoke zone which ever is greater.
  - d. Audio amplifiers and tone generating equipment shall be electrically supervised for normal and abnormal conditions.
  - e. Speaker circuits shall be electrically supervised for open and short circuit conditions. If a short circuit exists on a speaker circuit, it shall not be possible to

- activate that circuit.
  - f. Speaker circuits shall be either 25 VRMS or 70VRMS. Speaker circuits shall have 20% space capacity for future expansion or increased power output requirements.
2. The emergency voice alarm communication system shall incorporate a Two-way emergency telephone communication system.
- a. Two-way emergency telephone communication circuits shall be supervised for open and short circuit conditions.
  - b. Two-way emergency telephone (Fire Fighter Telephone) communication shall be supported between the Audio Command Center and up to seven (7) remote Fire Fighter's Telephone locations simultaneously on a telephone riser.
  - c. Means shall be provided to connect FFT voice communications to the speaker circuits in order to allow voice paging over the speaker circuit from a telephone handset.

I. Enclosures:

- 1. The control panel shall be housed in a UL-listed cabinet suitable for surface or semi-flush mounting. The cabinet and front shall be corrosion protected, given a rust-resistant prime coat, and manufacturer's standard finish.
- 2. The back box and door shall be constructed of steel with provisions for electrical conduit connections into the sides and top.
- 3. The door shall provide a key lock and shall include a glass or other transparent opening for viewing of all indicators. For convenience, the door may be site configured for either right or left hand hinging.

J. Power Supply:

- 1. A high tech off-line switching power supply shall be available for the fire alarm control panel or network node and provide power for the control panel and peripheral devices.
- 2. Provisions will be made to allow the audio-visual power to be increased as required by adding modular expansion audio-visual power supplies.
- 3. Positive-Temperature-Coefficient (PTC) thermistors, circuit breakers, or other over-current protection shall be provided on all power outputs. The power supply shall provide an integral battery charger or may be used with an external battery and charger system. Battery arrangement may be configured in the field.
- 4. The power supply shall continuously monitor all field wires for earth ground conditions, and shall have the following LED indicators:
  - Ground Fault LED
  - AC Power Fail LED
  - NAC on LED (4)
- 5. The main power supply shall operate on 120 VAC, 60 Hz, and shall provide all necessary power for the FACP.
- 6. The main power supply shall provide a battery charger using dual-rate charging techniques for fast battery recharge.
- 7. All circuits shall be power-limited, per UL864 requirements.

K. Specific System Operations

- 1. Smoke Detector Sensitivity Adjust: A means shall be provided for adjusting the sensitivity of any or all addressable intelligent detectors in the system from the system keypad. Sensitivity range shall be within the allowed UL window.
- 2. Alarm Verification: Each of the intelligent addressable smoke detectors in the system may be independently selected and enabled to be an alarm verified detector. The FACP shall keep a count of the number of times that each detector has entered the verification cycle. These counters may be displayed and reset by the proper operator commands.

3. Point Disable: Any addressable device or conventional circuit in the system may be enabled or disabled through the system keypad.
4. Point Read: The system shall be able to display or print the following point status diagnostic functions:
  - a. Device status
  - b. Device type
  - c. Custom device label
  - d. View analog detector values
  - e. Device zone assignments
  - f. All program parameters
5. System Status Reports: Upon command from an operator of the system, a status report will be generated and printed, listing all system status.
6. System History Recording and Reporting: The fire alarm control panel shall contain a history buffer that will be capable of storing events. Each of these activations will be stored and time and date stamped with the actual time of the activation. The contents of the history buffer may be manually reviewed, one event at a time, or printed in its entirety. The history buffer shall use non-volatile memory.
7. Automatic Detector Maintenance Alert: The fire alarm control panel shall automatically interrogate each intelligent detector and shall analyze the detector responses over a period of time. If any intelligent detector in the system responds with a reading that is above or below normal limits, then the system will enter the trouble mode, and the particular detector will be annunciated on the system display, and printed on the optional printer. This feature shall in no way inhibit the receipt of alarm conditions in the system, nor shall it require any special hardware, special tools or computer expertise to perform.
8. The fire alarm control panel shall include a walk test feature. It shall include the ability to test initiating device circuits and notification appliance circuits from the field without returning to the panel to reset the system. Operation shall be as follows:
  - a. Alarming an initiating device shall activate programmed outputs, which are selected to participate in walk test.
  - b. Introducing a trouble into the initiating device shall activate the programmed outputs.
  - c. All devices tested in walk test shall be recorded in the history buffer.
9. Waterflow Operation - An alarm from a waterflow detection device shall activate the appropriate alarm message on the main panel display, turn on all programmed notification appliance circuits and shall not be affected by the signal silence switch.
10. Supervisory Operation - An alarm from a supervisory device shall cause the appropriate indication on the system display, light a common supervisory LED, but will not cause the system to enter the trouble mode.
11. Signal Silence Operation - The FACP shall have the ability to program each output circuit (notification, relay, speaker etc) to deactivate upon depression of the signal silence switch.
12. Non-Alarm Input Operation - Any addressable initiating device in the system may be used as a non-alarm input to monitor normally open contact type devices. Non-alarm functions are a lower priority than fire alarm initiating devices.
13. Combo Zone - A special type code shall be available to allow waterflow and supervisory devices to share a common addressable module. Waterflow devices shall be wired in parallel, supervisory devices in series.

## 2.05 SYSTEM COMPONENTS

- A. Strobe lights shall meet the requirements of the ADA, UL Standard 1971, be fully synchronized, and shall meet the following criteria:
  1. The maximum pulse duration shall be 2/10 of one second
  2. Strobe intensity shall meet the requirements of UL 1971.
  3. The flash rate shall meet the requirements of UL 1971.

B. Horn/Strobes:

1. Operate on 24 VDC
2. Have two selectable tone options of temporal 3 and non-temporal continuous pattern.
3. Have at least 2 audibility options
4. Maximum Pulse Duration: 0.2 second.
5. Strobe Intensity: UL 1971.
6. Flash Rate: UL 1971.
7. Strobe Candela Rating: Determine by positioning selector switch on back of device.

C. Speakers:

1. All speakers shall operate on 25 VRMS or with field selectable output taps from 0.5 to 2.0 Watts.
2. Speakers in corridors and public spaces shall produce a nominal sound output of 84 dBA at 10 feet (3m).
3. Frequency response shall be a minimum of 400 HZ to 4000 HZ.
4. The back of each speaker shall be sealed to protect the speaker cone from damage and dust.

D. Audible/Visual Combination Devices:

1. Shall meet the applicable requirements of Section C listed above for audibility.
2. Shall meet the requirements of Section A listed above for visibility.

2.06 SYSTEM COMPONENTS - ADDRESSABLE DEVICES

A. Addressable Devices – General

1. Addressable devices shall use simple to install and maintain decade, decimal address switches.
2. Detectors shall be intelligent (analog) and addressable with decimal address switches, removable from the base, and connected with two wires to the fire alarm control panel Signaling Line Circuits.
3. Addressable smoke and thermal detectors shall provide dual alarm and power/polling LEDs. Both LEDs shall flash green under normal conditions, indicating that the detector is operational and in regular communication with the control panel, and both LEDs shall be placed into steady red illumination by the control panel, indicating that an alarm condition has been detected. If required, the LED flash shall have the ability to be removed from the system program. An output connection shall also be provided in the base to connect an external remote alarm LED.
4. The fire alarm control panel shall permit detector sensitivity adjustment through field programming of the system. The panel on a time-of-day basis shall automatically adjust sensitivity.
5. Using software in the FACP, detectors shall automatically compensate for dust accumulation and other slow environmental changes that may affect their performance. The detectors shall be listed by UL as meeting the calibrated sensitivity test requirements of NFPA Standard 72, Chapter 7.
6. The detectors shall be ceiling-mount and shall include a separate twist-lock base with tamper proof feature. Bases shall include a sounder base with a built-in (local) sounder rated at 85 DBA minimum, a relay base and an isolator base designed for Style 7 applications.
7. The detectors shall provide a test means whereby they will simulate an alarm condition and report that condition to the control panel. Such a test may be initiated at the detector itself (by activating a magnetic switch) or initiated remotely on command from the control panel.
8. Detectors shall also store an internal identifying type code that the control panel shall use to

identify the type of device (ION, PHOTO, THERMAL).

9. Detectors will operate in an analog fashion, where the detector simply measures its designed environment variable and transmits an analog value to the FACP based on real-time measured values. The FACP software, not the detector, shall make the alarm/normal decision, thereby allowing the sensitivity of each detector to be set in the FACP program and allowing the system operator to view the current analog value of each detector.
10. Addressable devices shall store an internal identifying code that the control panel shall use to identify the type of device.
11. A magnetic test switch shall be provided to test detectors and modules. Detectors shall report an indication of an analog value reaching 100% of the alarm threshold.
12. Addressable modules shall mount in a 4-inch square (101.6 mm square), 2-1/8 inch (54 mm) deep electrical box. An optional surface mount Lexan enclosure shall be available.

B. Intelligent Duct Smoke Detector

1. The smoke detector housing shall accommodate either an intelligent ionization detector or an intelligent photoelectric detector, of that provides continuous analog monitoring and alarm verification from the panel.
2. When sufficient smoke is sensed, an alarm signal is initiated at the FACP, and appropriate action taken to change over air handling systems to help prevent the rapid distribution of toxic smoke and fire gases throughout the areas served by the duct system.

2.07 BATTERIES

- A. The battery shall have sufficient capacity to power the fire alarm system for not less than twenty-four hours plus 5 minutes of alarm upon a normal AC power failure.
- B. The batteries are to be completely maintenance free. No liquids are required. Fluid level checks for refilling, spills, and leakage shall not be required.
- C. If necessary to meet standby requirements, external battery and charger systems may be used.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Installation shall be in accordance with the NEC, NFPA 72, local and state codes, as shown on the drawings, and as recommended by the major equipment manufacturer.
- B. All conduit, junction boxes, conduit supports and hangers shall be concealed in finished areas and may be exposed in unfinished areas. Smoke detectors shall not be installed prior to the system programming and test period. If construction is ongoing during this period, measures shall be taken to protect smoke detectors from contamination and physical damage.
- C. All fire detection and alarm system devices, and control panels shall be flush mounted when located in finished areas and may be surface mounted when located in unfinished areas.

3.02 TEST

The service of a competent, factory-trained engineer or technician authorized by the manufacturer of the fire alarm equipment shall be provided to technically supervise and participate during all of the adjustments and tests for the system. All testing shall be in accordance with NFPA 72, Chapter 7.

- A. Before energizing the cables and wires, check for correct connections and test for short circuits, ground faults, continuity, and insulation.

- B. Close each sprinkler system flow valve and verify proper supervisory alarm at the FACP.
- C. Verify activation of all waterflow switches.
- D. Open initiating device circuits and verify that the trouble signal actuates.
- E. Open and short signaling line circuits and verify that the trouble signal actuates.
- F. Open and short notification appliance circuits and verify that trouble signal actuates.
- G. Ground all circuits and verify response of trouble signals.
- H. Check presence and audibility of tone at all alarm notification devices.
- I. Check installation, supervision, and operation of all intelligent smoke detectors using the walk test.
- J. Each of the alarm conditions that the system is required to detect should be introduced on the system. Verify the proper receipt and the proper processing of the signal at the FACP and the correct activation of the control points.
- K. When the system is equipped with optional features, the manufacturer's manual shall be consulted to determine the proper testing procedures. This is intended to address such items as verifying controls performed by individually addressed or grouped devices, sensitivity monitoring, verification functionality and similar.

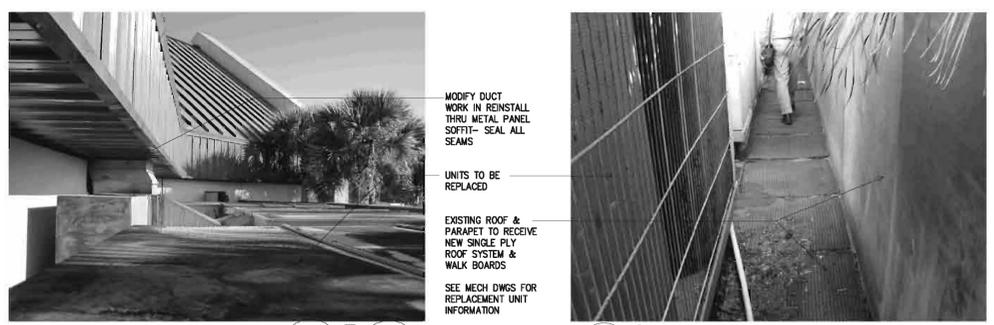
### 3.03 FINAL INSPECTION

- A. At the final inspection, a factory-trained representative of the manufacturer of the major equipment shall demonstrate that the system functions properly in every respect.

### 3.04 INSTRUCTION

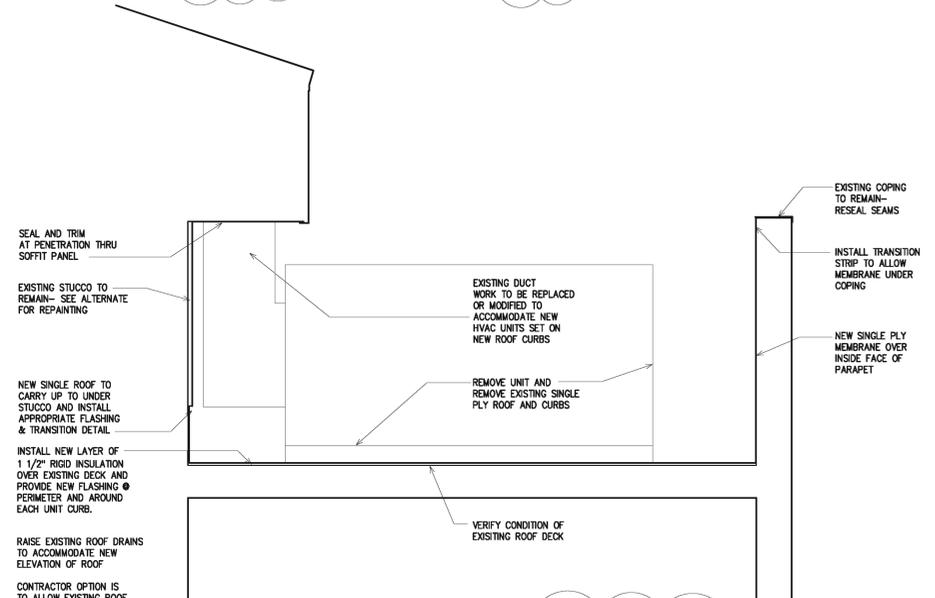
- A. Instruction shall be provided as required for operating the system. Hands-on demonstrations of the operation of all system components and the entire system including program changes and functions shall be provided.
- B. The contractor and/or the systems manufacturer's representatives shall provide a typewritten "Sequence of Operation."

END OF SECTION

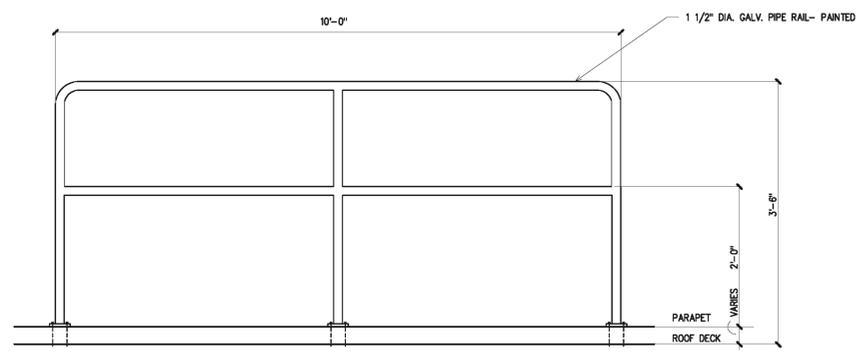


4 PHOTO  
 A3

3 PHOTO  
 A3

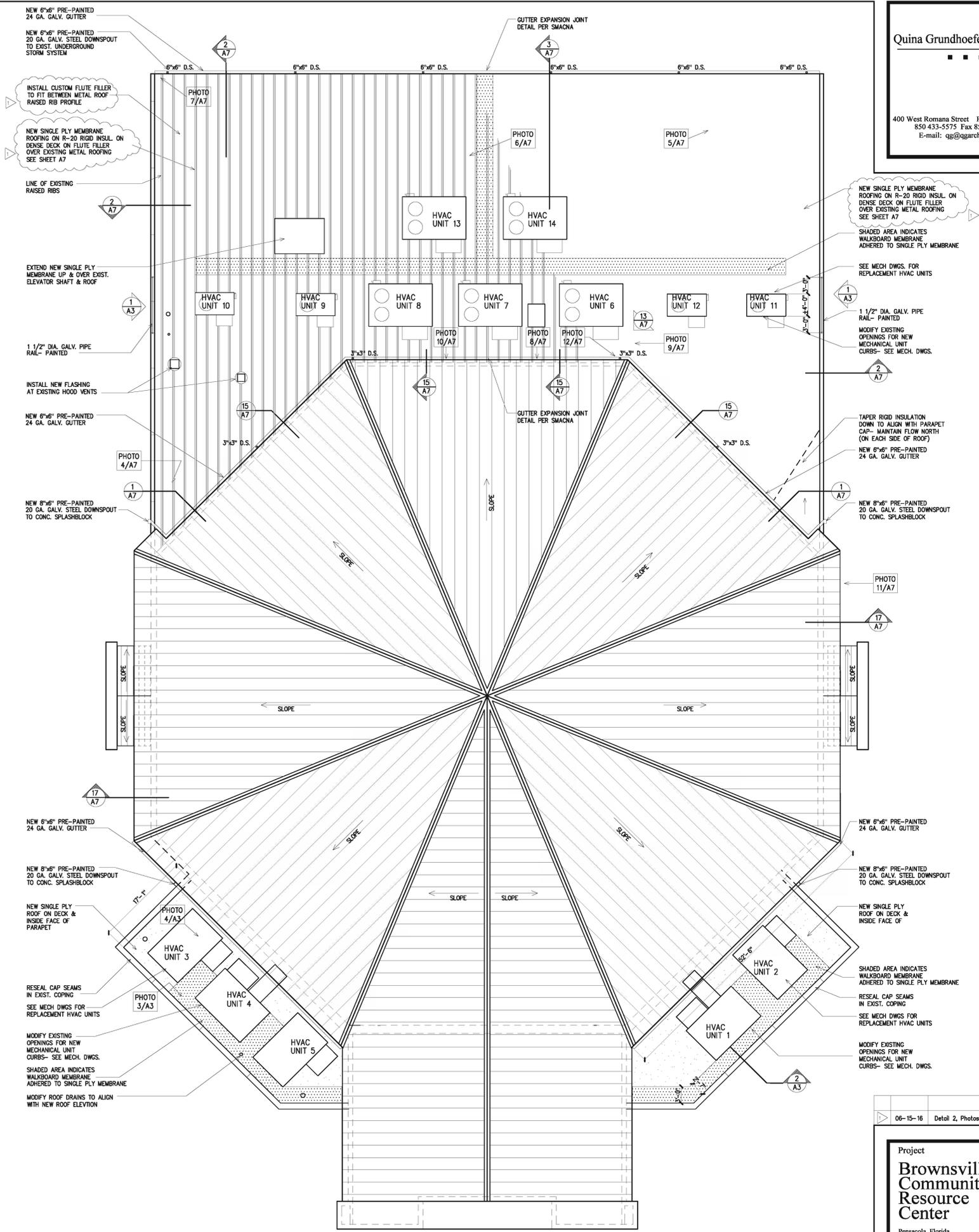


2 SECTION DETAIL  
 A3 SOUTH ROOF 1/2"=1'-0"



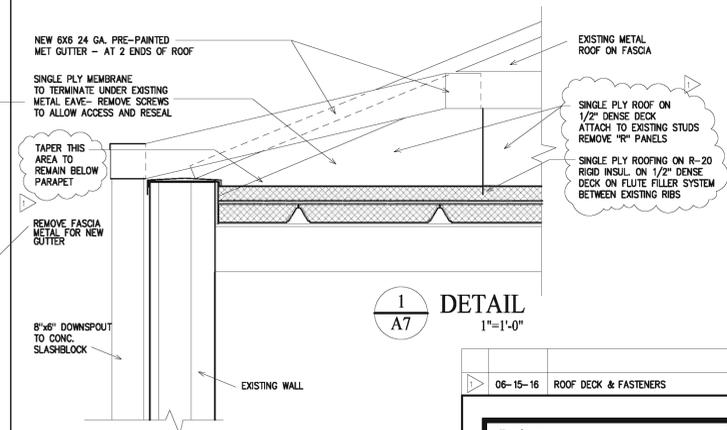
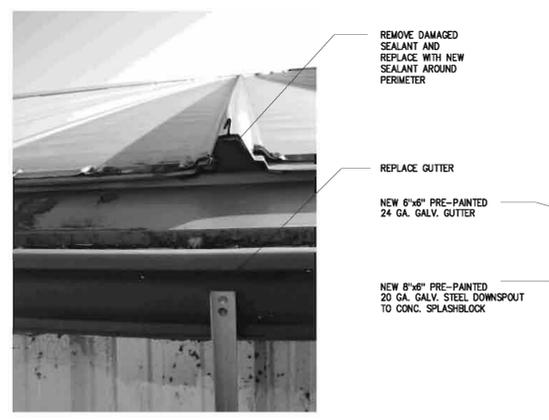
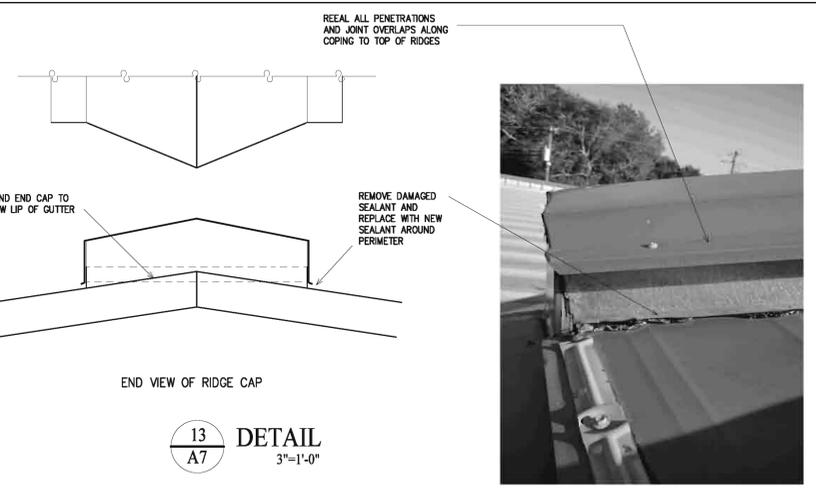
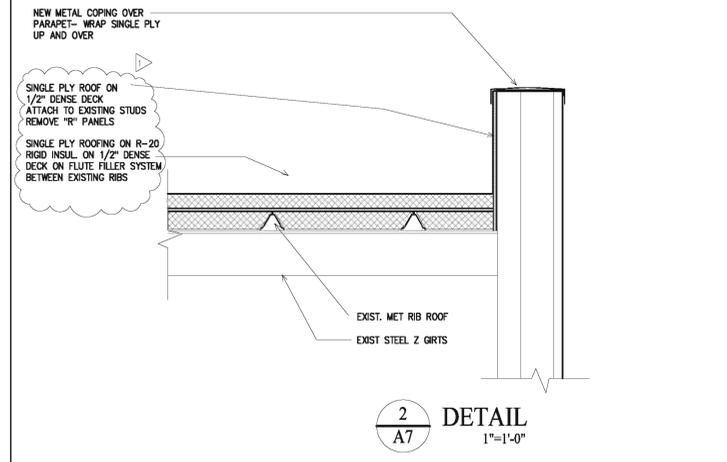
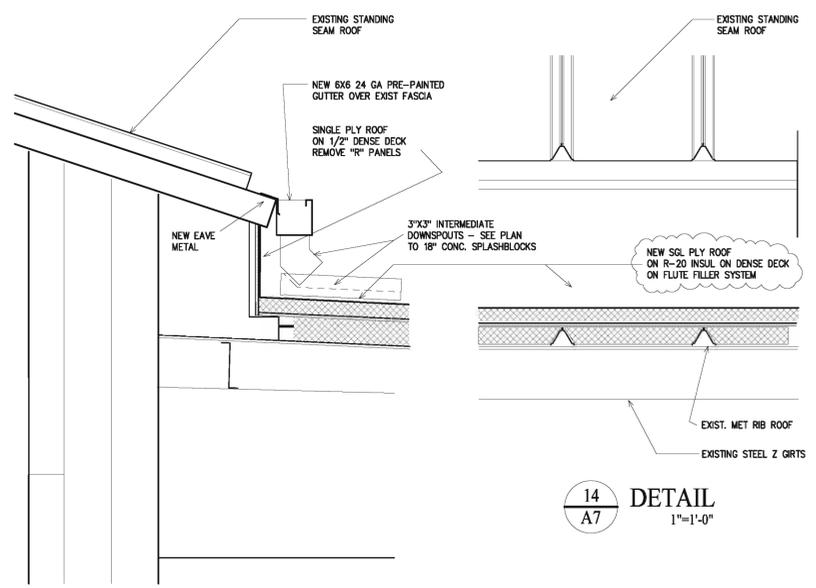
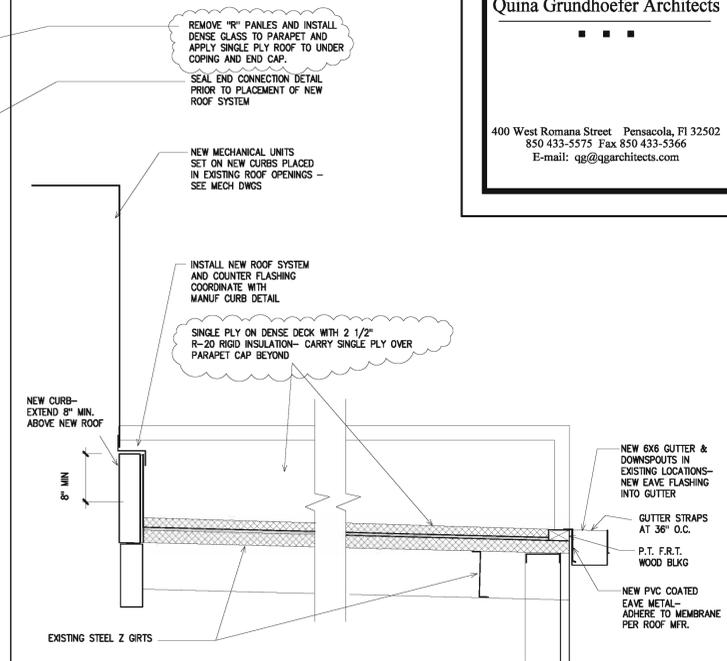
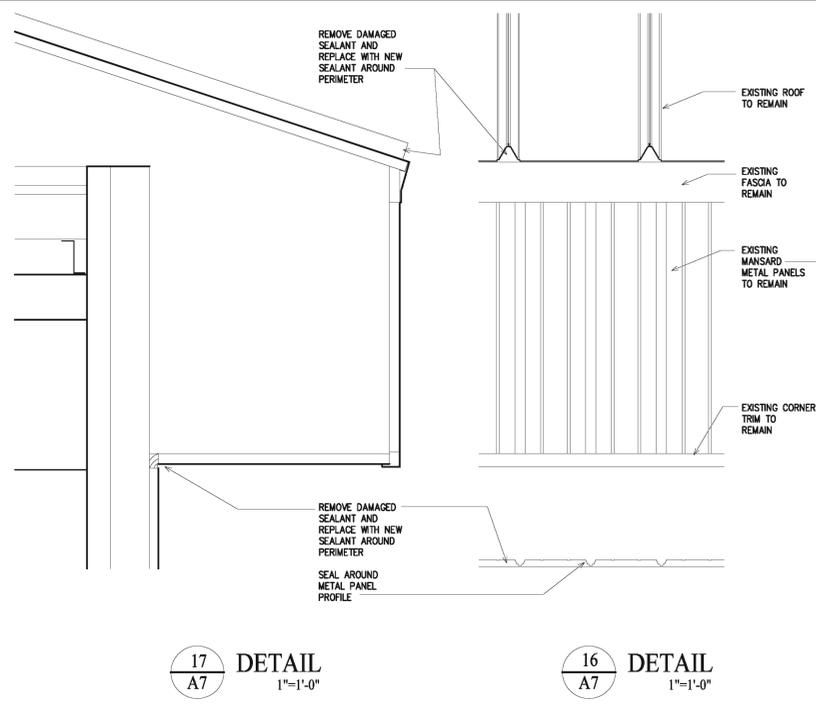
1 ELEVATION  
 A3 PIPE RAIL 1"=1'-0"

NOTE: RAILING TO EXTEND 2'-0" BEYOND SERVICE AREA OF MECH EQUIP ON EACH SIDE



ROOF PLAN  
 1/8"=1'-0"

06-15-16 Detail 2, Photos 3&4



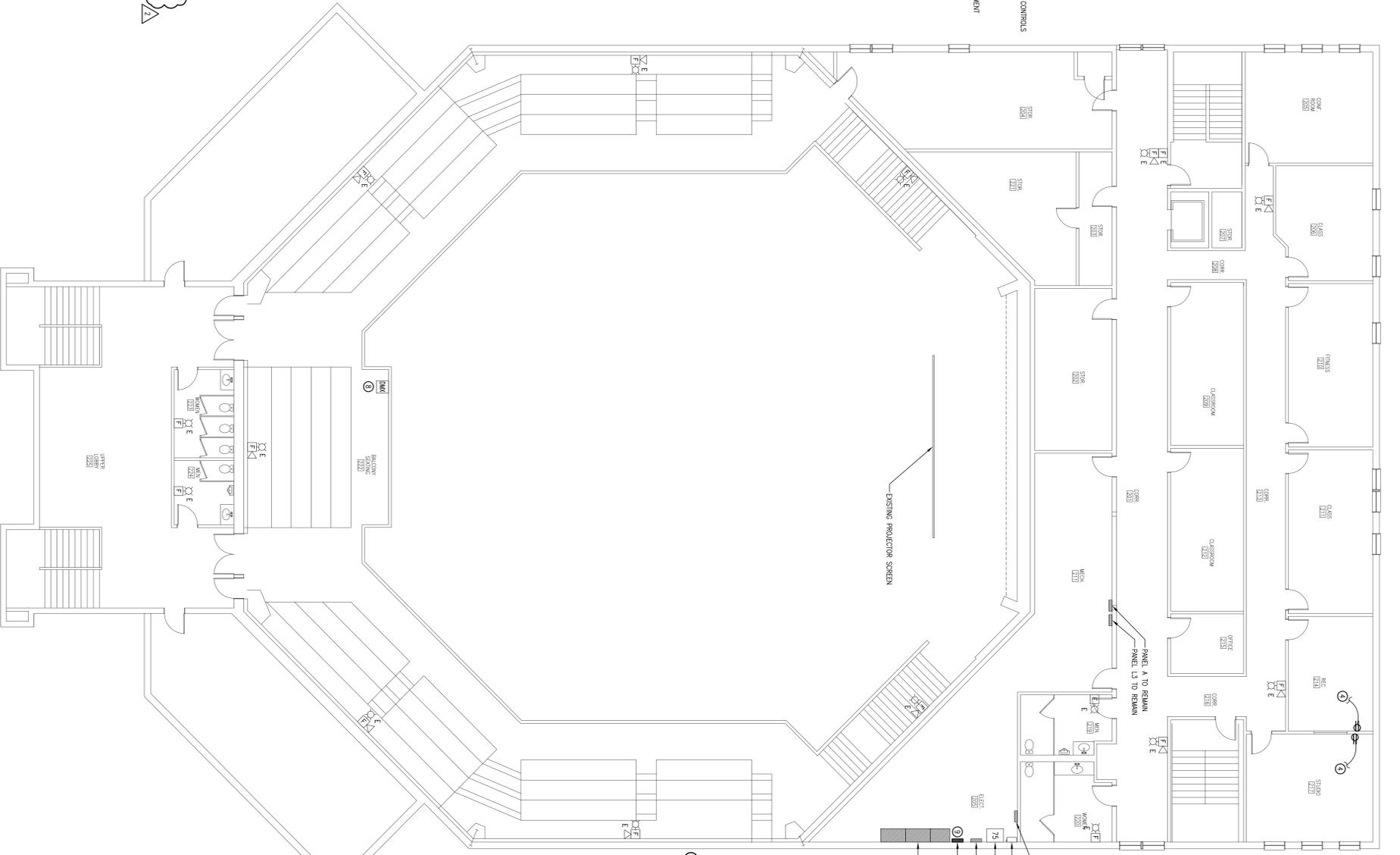
06-15-16 ROOF DECK & FASTENERS



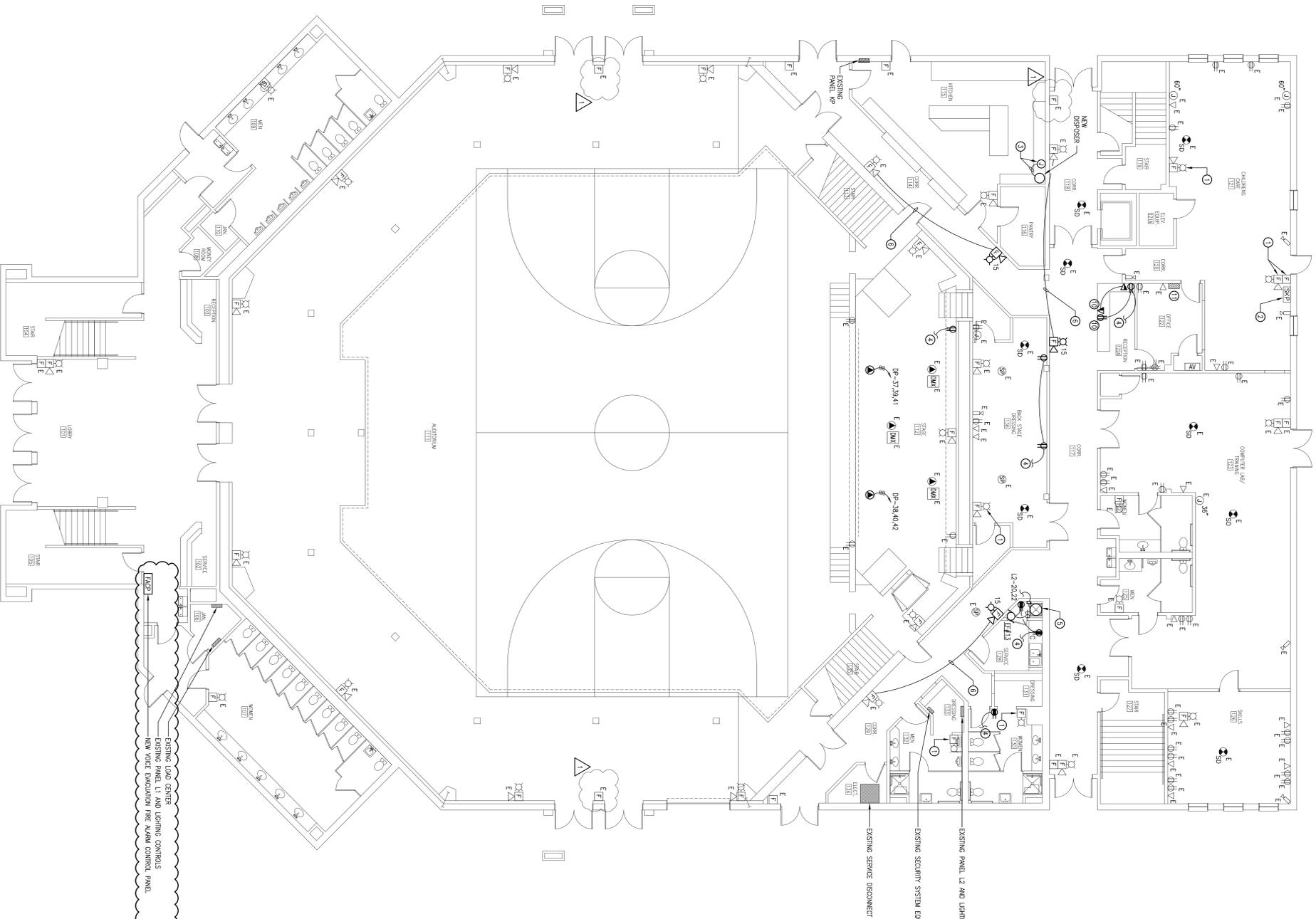
Quina Grundhoefer Architects

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- ELECTRICAL NEW WORK NOTES**
- 1 NEW LOCATION FOR FIRE ALARM DEVICE. PROVIDE NEW CONDUIT AND WIRE AS SHOWN. PROVIDE FIRE ALARM DEVICE IN THE CENTER OF THE ROOM. PROVIDE NEW CONDUIT AND WIRE AS REQUIRED FOR CONNECTION TO EXISTING SECURITY CIRCUIT.
  - 2 PROVIDE POWER CONNECTION TO SERVE NEW DISPENSER. RECONNECT EXISTING POWER CONNECTION TO NEW DISPENSER.
  - 3 PROVIDE POWER CONNECTION AS REQUIRED TO EXISTING RECEPTION CIRCUIT IN THIS AREA NOT TO OVERLOAD THE EXISTING CIRCUIT. PROVIDE NEW CONDUIT AND WIRE AS REQUIRED FOR CONNECTION TO NEW RECEPTIONS.
  - 4 NEW LOCATION FOR WATER HEATER. PROVIDE NEW CONDUIT AND WIRE AS SHOWN. PROVIDE NEW CONDUIT AND WIRE AS REQUIRED FOR CONNECTION TO EXISTING CIRCUIT FOR INSULATION AT NEW LOCATION. PROVIDE CONNECTION TO EXISTING CIRCUIT AS INDICATED. PROVIDE NEW 3/2 DISCONNECT ADJACENT TO WATER HEATER.
  - 5 CONNECT TO EXISTING WAC CIRCUIT. WAC CIRCUIT AS REQUIRED TO ACCOMMODATE NEW STRIPS. NOT TO OVERLOAD EXISTING CIRCUIT.
  - 6 NOT USED.
  - 7 NEW LOCATION OF DMX CABLE TERMINATION POINT FOR POWER STRIPS. PROVIDE ADDITIONAL DMX CABLE AS REQUIRED TO ROUTE CABLES UP TO SOUND BOOTH FOR TERMINATION AT NEW 070-SPLITTER.
  - 8 NEW LOAD CENTER DR. CONNECT EXISTING CIRCUITS TO NEW LOAD CENTERS. PROVIDE ADDITIONAL CONDUIT AND WIRING AS REQUIRED TO EXTEND CIRCUITS TO THE DOWNING STAGE. SHALL BE REMOVED COMPLETE WITH CONDUIT AND WIRING.
  - 9 COORDINATE DEVICE LOCATION AND CONDUIT ROUTING WITH THE DESIGNER.
  - 10 EXISTING TERMINATION POINT FOR COMMUNICATIONS WIRING.



POWER SECOND FLOOR NEW WORK PLAN  
 SCALE: 1/8" = 1'-0"



POWER FIRST FLOOR NEW WORK PLAN  
 SCALE: 1/8" = 1'-0"

06/14/16	ADDENDUM #2
06/03/16	ADDENDUM #1

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Project: **Brownsville Community Resource Center**  
 Pensacola, Florida

Drawn: 05-16-16  
 Project No. 0915

Sheet No. **E5**

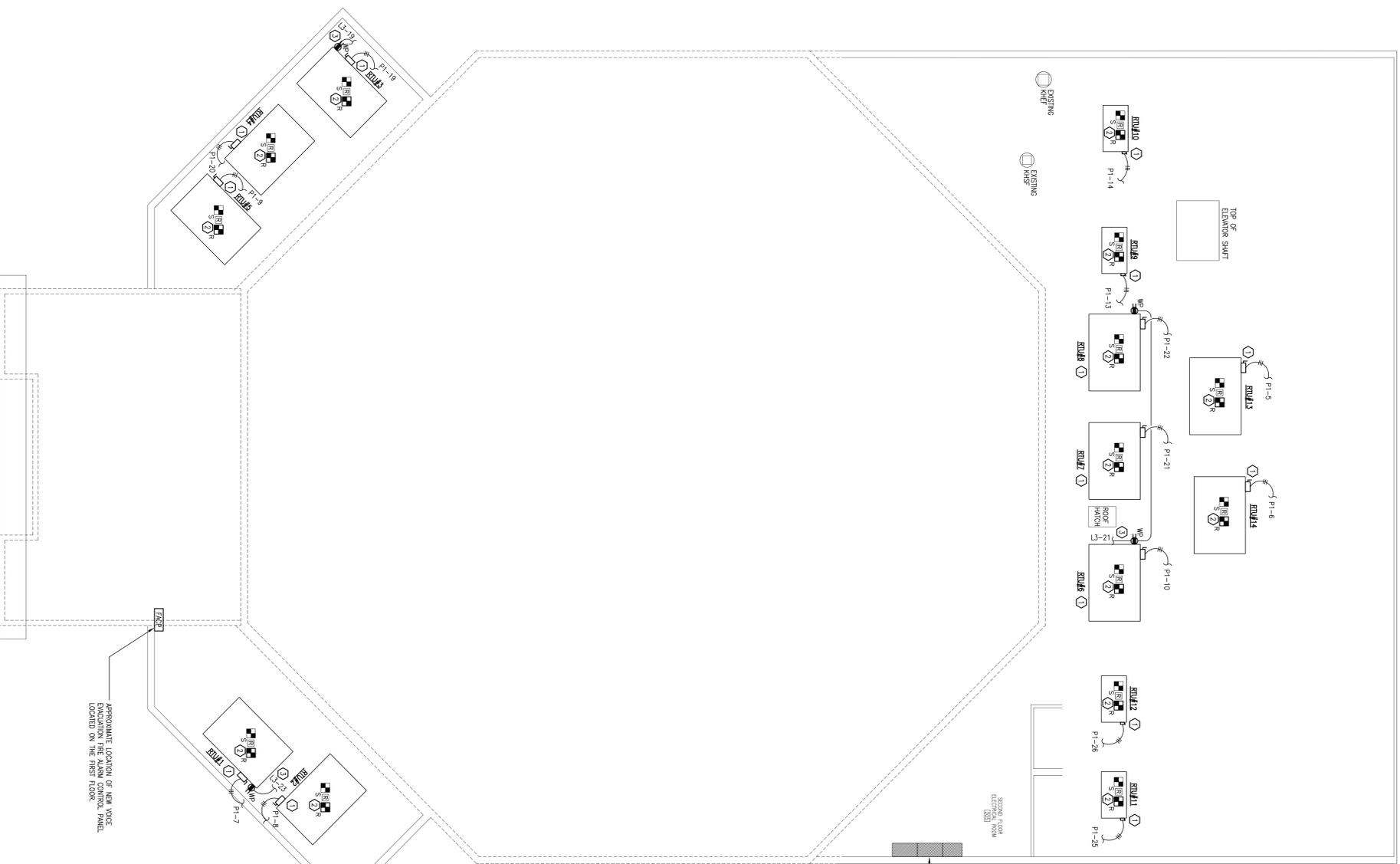
MECHANICAL EQUIPMENT ELECTRICAL SCHEDULE

MARK	ITEM	VOLUME/WT	MCA	LOAD (KW)	DISCONNECT SWITCH	OVERRIDE	CONDUCTORS	GROUND CONDUIT	PANEL	SEWING NOTES
RU1A	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	
RU1B	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	
RU1C	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	
RU1D	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	
RU1E	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	
RU1F	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	
RU1G	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	
RU1H	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	
RU1I	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	
RU1J	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	
RU1K	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	
RU1L	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	
RU1M	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	
RU1N	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	
RU1O	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	
RU1P	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	
RU1Q	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	
RU1R	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	
RU1S	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	
RU1T	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	
RU1U	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	
RU1V	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	
RU1W	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	
RU1X	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	
RU1Y	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	
RU1Z	ROOFTOP AIR CONDITIONING UNIT	208/3	142.9	200/3	NEMA 3R	175*	3/0	1/2"	P1 1/2	

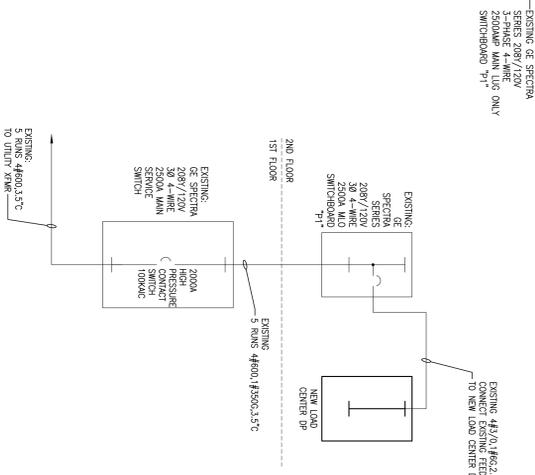
1. ALL ROOF TOP UNIT FEEDERS ARE EXISTING. SEE PANEL 711 SCHEDULE.  
2. CONDUCTOR SIZES SHALL NOT BE SMALLER THAN THE MANUFACTURER PROVIDED MCA VALUE.  
3. OVERRIDE PROTECTION SHALL NOT EXCEED THE MANUFACTURER PROVIDED MOP VALUE.  
4. MOTOR START-UP AND STOP PROTECTION EXCEEDS THE SIZES OF DESIGN ONLY. SEE MANUFACTURER'S DATA.  
5. ALL NEW WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AS REQUIRED BY MANUFACTURER OF EQUIPMENT PROVIDED AND INDICATE THE APPLICABLE CHANGES ON AS-BUILT DOCUMENTS.  
6. ALL ROOF TOP UNIT FEEDERS ARE EXISTING. SEE PANEL 711 SCHEDULE.  
7. CONDUCTOR SIZES SHALL NOT BE SMALLER THAN THE MANUFACTURER PROVIDED MCA VALUE.  
8. OVERRIDE PROTECTION SHALL NOT EXCEED THE MANUFACTURER PROVIDED MOP VALUE.  
9. MOTOR START-UP AND STOP PROTECTION EXCEEDS THE SIZES OF DESIGN ONLY. SEE MANUFACTURER'S DATA.  
10. ALL NEW WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AS REQUIRED BY MANUFACTURER OF EQUIPMENT PROVIDED AND INDICATE THE APPLICABLE CHANGES ON AS-BUILT DOCUMENTS.

ELECTRICAL NEW WORK KEYNOTES

1. NEW ROOF TOP UNIT: PROVIDE ANY/ALL NEW CONDUIT, WIRE, DEVICE MOUNTING HARDWARE, ETC AS REQUIRED (SIZE AND TYPE TO MATCH EXISTING) FOR INSTALLATION AT NEW LOCATION.
2. EXISTING SUPPLY SIDE DUCT SMOKE DETECTORS, EXISTING UNIT SHUT-DOWN RELAY, AND NEW RETURN SIDE DUCT SMOKE DETECTORS SHALL BE MONITORED BY THE NEW FIRE ALARM CONTROL PANEL. RETURN SIDE DUCT DETECTORS SHALL BE CONNECTED TO THE EXISTING SIC CIRCUIT, WHERE THE CIRCUIT WILL NOT BE OVERLOADED. PROVIDE ANY/ALL NEW CONDUIT AND WIRE (SIZE AS REQUIRED) TO MONITOR THE NEW RETURN SIDE DUCT DETECTORS FOR ADDITIONAL INFORMATION.
3. PROVIDE POWER CONNECTION AS REQUIRED TO EXISTING REINSTATEMENT CIRCUIT AS INDICATED.

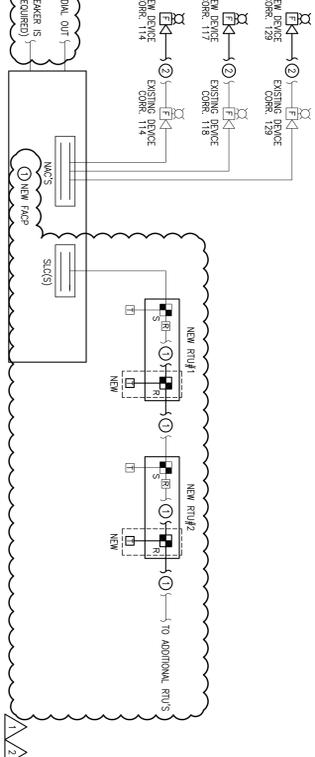


PARTIAL SINGLE LINE RISER DIAGRAM



PARTIAL FIRE ALARM SYSTEM RISER DIAGRAM KEYNOTES

1. CONNECT NEW RETURN SIDE DUCT DETECTORS TO EXISTING SIC CIRCUIT WHERE THE CIRCUIT IS CAPABLE OF THE ALARM DEVICES.
2. CONNECT TO EXISTING MAIN SERVICE UNDER THE CIRCUIT IS CAPABLE OF CARRYING THE NEW DEVICES. PROVIDE AN ADDITIONAL MCA CIRCUIT AS REQUIRED TO ACCOMMODATE THE NEW FIRE ALARM DEVICES.



EXISTING PANEL "P1" NEW WORK SCHEDULE SECTION 1				EXISTING PANEL "P1" NEW WORK SCHEDULE SECTION 2			
NO.	LOAD DESCRIPTION	WIRE TYPE	WIRE SIZE	NO.	LOAD DESCRIPTION	WIRE TYPE	WIRE SIZE
1	EX. SPNCE	3	100	15	EX. SPNCE	3	100
3	EX. ELEVATOR	3	100	17	NEW LOAD CENTER DP ##	3/0	3
5	NEW A/C RUIP13	3	125	19	NEW A/C RUI #3	3	125
7	NEW A/C RUIP1	3	175	21	NEW A/C RUI #7	3	175
9	NEW A/C RUIP5	3	175	23	EX. PANEL L1	3	175
11	EX. SPNCE L1S	3/0	3	25	NEW A/C RUI #11	3	130
13	NEW A/C RUIP9	3	45	26	NEW A/C RUI #12	3	130
TOTAL NEW CONNECTED LOAD				TOTAL EXISTING LOAD REMOVED			
511.5 KVA				501.2 KVA			
TOTAL NET LOAD ADDED TO BUILDING = 58 KW				TOTAL NET LOAD ADDED TO BUILDING = 58 KW			

FIRE ALARM SYSTEM GENERAL NOTES:

1. VERIFY EXACT NUMBER OF DEVICES FROM FLOOR PLAN, ICDI THE RISER DIAGRAM.
2. THE NAC CIRCUITS ARE SHOWN DIAGNOSTIC. MANUFACTURE NUMBER OF DEVICES ON ANY CIRCUIT IS LIMITED. PROVIDE ADDITIONAL HARDWARE AS REQUIRED.
3. SEC TO CONNECT ALL FIRE ALARM SYSTEM DEVICES FROM FLOOR PLANS. PROVIDE ADDITIONAL DEVICES AS REQUIRED.
4. BATTERY CABINETS AND NAC EXPANDERS SHALL BE LOCATED BELOW OR ADJACENT TO THE ALARM CONTROL PANEL.
5. ALL FIRE ALARM WORK SHALL BE PERFORMED BY QUALIFIED PERSONNEL AS DEFINED IN NFPA 72 SHOP DRAWINGS SHALL COMPLY WITH NFPA 72.
6. SPLICING OF FIRE ALARM WIRING IS STRICTLY PROHIBITED.
7. UPON PROJECT COMPLETION THE FIRE ALARM CONTROL PANEL SHALL BE CERTIFIED AND TESTED. PROVIDE WITH A RECORD OF COMPLETION AS REQUIRED IN NFPA 72.
8. THE FIRE ALARM INSTALLER SHALL BE LICENSED AS A CERTIFIED FIRE ALARM CONTRACTOR. THE CONTRACTOR MUST HAVE A MASTER LEVEL IN THE STATE OF FLORIDA. THE CONTRACTOR SHALL BE ISSUED IN THE NAME OF THE CERTIFICATE HOLDER AND THE CONTRACTOR, TECHNICIANS WORKING FOR THE CERTIFIED CONTRACTOR SHALL BE ISSUED IN THE NAME OF THE CERTIFIED CONTRACTOR. CONTRACTORS WORKING TO BE ON FIRE ALARM WORK SHALL SHOW EVIDENCE AT THE PRE-BID CONFERENCE THAT HE/SHE MEETS THE STATE REQUIREMENTS AND HOLD A HEAVY ISSUED BY THE STATE FIRE DEPARTMENT.
9. ALL FIRE ALARM SYSTEM WIRING SHALL BE INSTALLED IN CONDUIT. WIRING MANUFACTURER SHALL BE AS RECOMMENDED BY THE ALARM SYSTEM MANUFACTURER.

